

IN THE CLAIMS

This listing of claims replaces all prior listings:

1. (Cancelled).

2. (Cancelled).

3. (Currently Amended) A method for detecting similar time series of a pair of time series patterns, with the time series patterns being a time series of vectors, said method comprising:

a vector decision step of calculating a degree of similarity between a pair of vectors of said paired time series patterns and providing a decision as to whether or not said paired vectors are similar to each other, based on said degree of similarity; and

a time series decision step of counting the number of similar vectors decided to be similar and/or dissimilar vectors decided to be dissimilar in said vector decision step and providing a decision as to whether or not the paired time series patterns are similar, based on the results of the counting ~~The method for detecting similar time series according to claim 2,~~

wherein,

said degree of similarity is the distance between said paired vectors; and

said vector decision step includes (a) a hierarchical distance calculating step of hierarchically calculating the distance between said paired vectors, (b) a threshold value comparing step of comparing an integrated distance value calculated in each hierarchy of said hierarchical distance calculating step to a first threshold value pertinent to the distance, and (c) a decision step of determining whether or not said paired vectors are similar to each other, responsive in response to the results of comparison in said threshold comparing step; ~~wherein~~ _____ if, in said threshold comparing step, the integrated distance value calculated up to the last hierarchy is smaller than said first threshold value, said paired vectors are determined to be similar in said decision step, and ~~wherein~~,

_____ if said integrated distance value calculated up to a given hierarchy exceeds said first threshold value, said paired vectors are determined to be dissimilar, and ~~control is performed to discontinue~~ the distance calculations are discontinued for the remaining hierarchies.

4. (Currently Amended) The method for detecting similar time series according to claim 3, wherein,

_____ in said hierarchical distance calculating step, the distance between components making up the paired vectors is calculated hierarchically, and ~~wherein,~~

_____ if, in said threshold comparing step, the integrated distance value calculated up to a given hierarchy is lower than the first threshold value, the next calculations of the distance between the components are carried out.

5. (Currently Amended) The method for detecting similar time series according to claim 4, wherein

_____ said vector decision step further includes a transform step of applying a preset transform to said paired vectors; and ~~wherein~~

_____ in said hierarchical distance calculating step, the distance between the paired vectors, transformed by said transform step, is calculated in a preset sequence which is based on said preset transform.

6. (Currently Amended) The method for detecting similar time series according to claim 5, wherein
_____said preset transform is a transform of re-arraying said components making up said paired vectors in the order of the magnitudes of the variance of said components; and ~~wherein~~
_____in said hierarchical distance calculating step, the distance between the paired vectors, transformed by said transform step, is calculated in the order of the decreasing magnitudes of the variance of the components.

7. (Currently Amended) The method for detecting similar time series according to claim 5, wherein
_____said preset transform is the discrete cosine transform or the discrete Fourier transform; and ~~wherein~~
_____in said hierarchical distance calculating step, the distance calculations between the paired vectors transformed by said transform step are carried out sequentially beginning from the low frequency components.

8. (Currently Amended) The method for detecting similar time series according to claim 5, wherein
_____said preset transform is the Walsh-Hadamard transform; and ~~wherein~~
_____in said hierarchical distance calculating step, the distance calculations between the paired vectors transformed by said transform step are carried out sequentially beginning from the low sequency components.

9. (Currently Amended) The method for detecting similar time series according to claim 5, wherein
_____ said preset transform is the Karhunen-Loeve transform; and ~~wherein~~
_____ in said hierarchical distance calculating step, the distance calculations between the paired vectors transformed by said transform step are carried out sequentially beginning from components of high characteristic value.

10. (Currently Amended) The method for detecting similar time series according to claim 5, wherein
_____ said vector decision step further includes a splitting step of taking out components making up each of said paired vectors, transformed by said transform step, in said preset sequence, and splitting said component into a plurality of hierarchical partial vectors; ~~and~~
~~wherein~~
_____ in said hierarchical distance calculating step, distance calculations between the respective components forming partial vectors are carried out hierarchically beginning from the partial vector of the uppermost hierarchy; and
_____ when the integrated value of the distance calculated for the totality of the components making up the partial vectors up to a given hierarchy is lower than said first threshold value, the distance calculations between the components forming the partial vectors of the hierarchy lower by one hierarchy are carried out.

11. (Currently Amended) A method for detecting similar time series of a pair of time series patterns, with the time series patterns being time series of vectors, said method comprising:
a vector decision step of calculating a degree of similarity between a pair of vectors of said paired time series patterns and providing a decision as to whether or not said paired vectors are similar to each other, based on said degree of similarity; and
a time series decision step of counting the number of similar vectors decided to be similar and/or dissimilar vectors decided to be dissimilar in said vector decision step and providing a decision as to whether or not the paired time series patterns are similar, based on the results of the counting ~~The method for detecting similar time series according to claim 1,~~
wherein,

said time series decision step includes (a) a hierarchical counting step of hierarchically counting the number of said similar vectors and/or said dissimilar vectors, (b) a threshold value comparing step of comparing an integrated value of the number of said similar vectors and/or said dissimilar vectors, obtained in each hierarchy of said hierarchical counting step, to a second threshold value of the number of similar vectors, and (c) a decision step of determining the similarity of said paired time series patterns, responsive to the results of comparison in said threshold value comparing step; ~~wherein,~~

if, in said threshold value comparing step, the integrated value of the number of said similar vectors calculated up to the last hierarchy is larger than said second threshold value, said paired time series patterns are determined to be similar in said decision step, and
~~wherein,~~

_____ if the integrated value of the number of the dissimilar vectors, calculated up to a given hierarchy, exceeds the total number of said vectors in said time series pattern less said second threshold value, said paired time series patterns are determined to be dissimilar, and control is performed to discontinue the calculations for the remaining hierarchies.

12. (Currently Amended) A method for detecting similar time series of a pair of time series patterns, with the time series patterns being time series of vectors, said method comprising:

_____ a vector decision step of calculating a degree of similarity between a pair of vectors of said paired time series patterns and providing a decision as to whether or not said paired vectors are similar to each other, based on said degree of similarity; and

_____ a time series decision step of counting the number of similar vectors decided to be similar and/or dissimilar vectors decided to be dissimilar in said vector decision step and providing a decision as to whether or not the paired time series patterns are similar, based on the results of the counting ~~The method for detecting similar time series according to claim 1,~~

wherein,

_____ said vector is the vectorized features of audio signals, and wherein

_____ said time series pattern is a time series of vectorized power spectrum coefficients in a preset time domain of said audio signals.

13. (Currently Amended) A method for detecting similar time series of a pair of time series patterns, with the time series patterns being time series of vectors, said method comprising:

_____ a vector decision step of calculating a degree of similarity between a pair of vectors of said paired time series patterns and providing a decision as to whether or not said paired vectors are similar to each other, based on said degree of similarity; and

_____ a time series decision step of counting the number of similar vectors decided to be similar and/or dissimilar vectors decided to be dissimilar in said vector decision step and providing a decision as to whether or not the paired time series patterns are similar, based on the results of the counting ~~The method for detecting similar time series according to claim 1,~~
wherein,

_____ said vector is the vectorized features of audio signals, and wherein

_____ said time series pattern is a time series of vectorized linear predictive coefficients in a preset time domain of said audio signals.

14. (Currently Amended) A method for detecting similar time series of a pair of time series patterns, with the time series patterns being time series of vectors, said method comprising:

_____ a vector decision step of calculating a degree of similarity between a pair of vectors of said paired time series patterns and providing a decision as to whether or not said paired vectors are similar to each other, based on said degree of similarity; and

_____ a time series decision step of counting the number of similar vectors decided to be similar and/or dissimilar vectors decided to be dissimilar in said vector decision step and providing a decision as to whether or not the paired time series patterns are similar, based on the results of the counting ~~The method for detecting similar time series according to claim 1,~~
wherein,

_____ said vector is the vectorized features of encoded audio signals, and wherein

_____ said time series pattern is a time series of vectorized parameters representing the intensity of the frequency components in each frame of said encoded audio signals.

15. (Currently Amended) A method for detecting similar time series of a pair of time series patterns, with the time series patterns being time series of vectors, said method comprising:

_____ a vector decision step of calculating the degree of similarity between a pair of vectors of said paired time series patterns and providing a decision as to whether or not said paired vectors are similar to each other, based on said degree of similarity; and

_____ a time series decision step of counting the number of similar vectors decided to be similar and/or dissimilar vectors decided to be dissimilar in said vector decision step and providing a decision as to whether or not the paired time series patterns are similar, based on the results of the counting ~~The method for detecting similar time series according to claim 1,~~ wherein,

said vector is the vectorized features of video signals, and ~~wherein~~

_____ said time series pattern is a time series of vectorized signal values of a representative picture in a preset time domain of said video signals, an average picture of frame pictures in said preset time domain or a small-sized picture, obtained on splitting said representative picture or said average picture in terms of a preset block as a unit.

16. (Currently Amended) A method for detecting similar time series of a pair of time series patterns, with the time series patterns being time series of vectors, said method comprising:

a vector decision step of calculating the degree of similarity between a pair of vectors of said paired time series patterns and providing a decision as to whether or not said paired vectors are similar to each other, based on said degree of similarity; and

a time series decision step of counting the number of similar vectors decided to be similar and/or dissimilar vectors decided to be dissimilar in said vector decision step and providing a decision as to whether or not the paired time series patterns are similar, based on the results of the counting ~~The method for detecting similar time series according to claim 1,~~
wherein,

said vector is the vectorized features of video signals, and ~~wherein~~

~~_____~~ said time series pattern is a time series of vectorized histograms for luminance and/or chroma in a frame picture in a preset time domain of said video signals.

17. (Currently Amended) A method for detecting similar time series of a pair of time series patterns, with the time series patterns being time series of vectors, said method comprising:

a vector decision step of calculating the degree of similarity between a pair of vectors of said paired time series patterns and providing a decision as to whether or not said paired vectors are similar to each other, based on said degree of similarity; and

a time series decision step of counting the number of similar vectors decided to be similar and/or dissimilar vectors decided to be dissimilar in said vector decision step and providing a decision as to whether or not the paired time series patterns are similar, based on the results of the counting ~~The method for detecting similar time series according to claim 1,~~
wherein,

said vector is the vectorized features of encoded video signals, and ~~wherein~~

_____ said time series pattern is a time series of vectorized signal values of DC components of respective blocks as encoding units of an intra-frame encoded picture in direct proximity of a preset time domain of said encoded video signals.

18. (Currently Amended) A method for detecting similar time series of a pair of time series patterns, with the time series patterns being time series of vectors, said method comprising:

_____ a vector decision step of calculating the degree of similarity between a pair of vectors of said paired time series patterns and providing a decision as to whether or not said paired vectors are similar to each other, based on said degree of similarity; and

_____ a time series decision step of counting the number of similar vectors decided to be similar and/or dissimilar vectors decided to be dissimilar in said vector decision step and providing a decision as to whether or not the paired time series patterns are similar, based on the results of the counting ~~The method for detecting similar time series according to claim 1,~~ wherein,

_____ one of said paired time series patterns is sliced from a time series of a vector longer than said time series patterns and wherein similarity is sequentially checked as the slicing position is updated.

19. (Cancelled).

20. (Cancelled).

21. (Currently Amended) An apparatus for detecting similar time series of a pair of time series patterns, with the time series patterns being time series of vectors, said apparatus comprising:

vector decision means for calculating the degree of similarity between a pair of vectors of said paired time series patterns and providing a decision as to whether or not said paired vectors are similar to each other, based on said degree of similarity; and

time series decision means for counting the number of similar vectors decided to be similar and/or dissimilar vectors decided to be dissimilar in said vector decision means and providing a decision as to whether or not the paired time series patterns are similar, based on the results of the counting ~~The apparatus for detecting similar time series according to claim 20, wherein,~~

said vector decision means includes (a) hierarchical distance calculating means for hierarchically calculating the distance between said paired vectors, (b) threshold value comparing means for comparing an integrated distance value calculated in each hierarchy of said hierarchical distance calculating means to a first threshold value pertinent to the distance, and (c) decision means for determining whether or not said paired vectors are similar to each other, responsive to the results of comparison in said threshold comparing means; ~~wherein,~~

said degree of similarity is the distance between said paired vectors, and

~~in~~ said decision means being configured such that, if, as a result of comparison by said threshold comparing means, the integrated distance value calculated up to the last hierarchy is smaller than said first threshold value, said paired vectors are determined to be similar, and ~~wherein,~~

if an integrated distance value calculated up to a given hierarchy exceeds said first threshold value, said paired vectors are determined to be dissimilar, and control is performed to discontinue the distance calculations for the remaining hierarchies is ended.

22. (Currently Amended) The apparatus for detecting similar time series according to claim 21 wherein
_____ said hierarchical distance calculating means ~~calculates~~ is configured to calculate the distance between components making up the paired vectors hierarchically, and ~~wherein~~,
_____ if, as a result of comparison by said threshold comparing means, the integrated distance value calculated up to a given hierarchy is lower than the first threshold value, the next calculations of the distance between the components are carried out.

23. (Currently Amedned) The apparatus for detecting similar time series according to claim 22, wherein
_____ said vector decision means further includes a transform means for applying a preset transform to said paired vectors, and ~~wherein~~
_____ said hierarchical distance calculating means ~~calculates~~ is configured to calculate the distance between the paired vectors, transformed by said transform means, in a preset sequence which is based on said preset transform.

24. (Currently Amended) The apparatus for detecting similar time series according to claim 23, wherein
_____ said vector decision means further includes splitting means for taking out components making up each of said paired vectors, transformed by said transform means, in said preset sequence, and splitting said components into a plurality of hierarchical partial vectors,
~~wherein~~
_____ said hierarchical distance calculating means ~~executes~~ is configured to execute distance calculations between the respective components forming partial vectors hierarchically beginning from the partial vector of the uppermost hierarchy, and ~~wherein~~

_____ the distance calculations between the components forming the partial vectors of the hierarchy lower by one hierarchy are carried out when the integrated value of the distance calculated for the totality of the components making up the partial vectors up to a given hierarchy is lower than said first threshold value.

25. (Currently Amended) An apparatus for detecting similar time series of a pair of time series patterns, with the time series patterns being time series of vectors, said apparatus comprising:

_____ vector decision means for calculating the degree of similarity between a pair of vectors of said paired time series patterns and providing a decision as to whether or not said paired vectors are similar to each other, based on said degree of similarity; and

_____ time series decision means for counting the number of similar vectors decided to be similar and/or dissimilar vectors decided to be dissimilar in said vector decision means and providing a decision as to whether or not the paired time series patterns are similar, based on the results of the counting. ~~The apparatus for detecting similar time series according to claim~~

~~19~~ wherein,

said time series decision means includes (a) hierarchical counting means for hierarchically counting the number of said similar vectors and/or said dissimilar vectors, (b) threshold value comparing means for comparing an integrated value of the number of said similar vectors and/or said dissimilar vectors, obtained in each hierarchy of said hierarchical counting means, to a second threshold value of the number of similar vectors, and (c) decision means for determining the similarity of said paired time series patterns, responsive to the results of comparison in said threshold value comparing means, ~~wherein~~

if, as a result of comparison by said threshold value comparing means, the integrated value of the number of said similar vectors calculated up to the last hierarchy is larger than said second threshold value, said decision means determines the paired time series patterns to be similar, and ~~wherein,~~

if the integrated value of the number of the dissimilar vectors, calculated up to a given hierarchy, exceeds the total number of said vectors in said time series pattern less said second threshold value, said decision means determines the paired time series patterns to be dissimilar, and control is performed to discontinue the distance calculations for the remaining hierarchies.

26. (Cancelled).

27. (Cancelled).

28. (Currently Amended) A program for having a computer execute the processing of detecting similar time series of a pair of time series patterns, with the time series patterns being time series of vectors, said program comprising:

a vector decision step of calculating the degree of similarity between a pair of vectors of said paired time series patterns and providing a decision as to whether or not said paired vectors are similar to each other, based on said degree of similarity; and

a time series decision step of counting the number of similar vectors decided to be similar and/or dissimilar vectors decided to be dissimilar in said vector decision step and providing a decision as to whether or not the paired time series patterns are similar, based on the results of the counting ~~The program for detecting similar time series according to claim~~

~~27,~~ wherein,

said degree of similarity is the distance between said paired vectors,

_____ said vector decision step includes (a) a hierarchical distance calculating step of hierarchically calculating the distance between said paired vectors, (b) a threshold value comparing step of comparing an integrated distance value calculated in each hierarchy of said hierarchical distance calculating step to a first threshold value pertinent to the distance and (c) a decision step of determining whether or not said paired vectors are similar to each other, responsive to the results of comparison in said threshold comparing step; ~~wherein~~

if, in said threshold comparing step, the integrated distance value calculated up to the last hierarchy is smaller than said first threshold value, said paired vectors are determined to be similar in said decision step, and ~~wherein~~,

if an integrated distance value calculated up to a given hierarchy exceeds said first threshold value, said paired vectors are determined to be dissimilar, and control is performed to discontinue the distance calculations for the remaining hierarchies.

29. (Currently Amended) The program for detecting similar time series according to claim 28, wherein,

_____ in said hierarchical distance calculating step, the distance between components making up the paired vectors is calculated hierarchically; and,

_____ if, in said threshold comparing step, the integrated distance value calculated up to a given hierarchy is lower than the first threshold value, the next calculations of the distance between the components are carried out.

30. (Currently Amended) The program for detecting similar time series according to claim 29, wherein

_____ said vector decision step further includes a transform step of applying a preset transform to said paired vectors; and ~~wherein~~

_____ in said hierarchical distance calculating step, the distance between the paired vectors, transformed by said transform step, is calculated in a preset sequence which is based on said preset transform.

31. (Currently Amended) The program for detecting similar time series according to claim 30, wherein

_____ said vector decision step further includes a splitting step of taking out components making up each of said paired vectors, transformed by said transform step, in said preset sequence, and splitting said component into a plurality of hierarchical partial vectors; and

wherein

_____ in said hierarchical distance calculating step, distance calculations between the respective components forming partial vectors are carried out hierarchically beginning from the partial vector of the uppermost hierarchy; when the integrated value of the distance calculated for the totality of the components making up the partial vectors up to a given hierarchy is lower than said first threshold value, the distance calculations between the components forming the partial vectors of the hierarchy lower by one hierarchy are carried out.

32. (Currently Amended) A program for having a computer execute the processing of detecting similar time series of a pair of time series patterns, with the time series patterns being time series of vectors, said program comprising:

_____ a vector decision step of calculating the degree of similarity between a pair of vectors of said paired time series patterns and providing a decision as to whether or not said paired vectors are similar to each other, based on said degree of similarity; and

_____ a time series decision step of counting the number of similar vectors decided to be

similar and/or dissimilar vectors decided to be dissimilar in said vector decision step and providing a decision as to whether or not the paired time series patterns are similar, based on the results of the counting ~~The program for detecting similar time series according to claim 26, wherein,~~

said time series decision step includes (a) a hierarchical counting step of hierarchically counting the number of said similar vectors and/or said dissimilar vectors, (b) a threshold value comparing step of comparing an integrated value of the number of said similar vectors and/or said dissimilar vectors, obtained in each hierarchy of said hierarchical counting step, to a second threshold value of the number of similar vectors, and (c) a decision step of determining the similarity of said paired time series patterns, responsive to the results of comparison in said threshold value comparing step, ~~wherein~~

if, in said threshold value comparing step, the integrated value of the number of said similar vectors calculated up to the last hierarchy is larger than said second threshold value, said paired time series patterns are determined to be similar in said decision step, and ~~wherein,~~

if the integrated value of the number of the dissimilar vectors, calculated up to a given hierarchy, exceeds the total number of said vectors in said time series pattern less said second threshold value, said paired time series patterns are determined to be dissimilar, and control is performed to discontinue the calculations for the remaining hierarchies.

33. (Cancelled).

34. (Cancelled).

35. (Currently Amended) A computer-controllable recording medium having recorded thereon a program for having a computer execute the processing of detecting similar time series of a pair of time series patterns, with the time series patterns being time series of vectors, said program comprising:

a vector decision step of calculating the degree of similarity between a pair of vectors of said paired time series patterns and providing a decision as to whether or not said paired vectors are similar to each other, based on said degree of similarity; and a time series decision step of counting the number of similar vectors decided to be similar and/or dissimilar vectors decided to be dissimilar in said vector decision step and providing a decision as to whether or not the paired time series patterns are similar, based on the results of the counting ~~The recording medium according to claim 34, wherein,~~

said degree of similarity is the distance between said paired vectors,

said vector decision step includes (a) a hierarchical distance calculating step of hierarchically calculating the distance between said paired vectors, (b) a threshold value comparing step of comparing an integrated distance value calculated in each hierarchy of said hierarchical distance calculating step to a first threshold value pertinent to the distance, and (c) a decision step of determining whether or not said paired vectors are similar to each other, responsive to the results of comparison in said threshold comparing step; ~~wherein~~

if, in said threshold comparing step, the integrated distance value calculated up to the last hierarchy is smaller than said first threshold value, said paired vectors are determined to be similar in said decision step, and ~~wherein,~~

if an integrated distance value calculated up to a given hierarchy exceeds said first threshold value, said paired vectors are determined to be dissimilar, and control is performed to discontinue the distance calculations for the remaining hierarchies.

36. (Currently Amended) The recording medium according to claim 35, wherein, _____in said hierarchical distance calculating step, the distance between components making up the paired vectors is calculated hierarchically, and ~~wherein~~, _____if, in said threshold comparing step, the integrated distance value calculated up to a given hierarchy is lower than the first threshold value, the next calculations of the distance between the components are carried out.

37. (Currently Amended) The recording medium according to claim 35, wherein _____said vector decision step further includes a transform step of applying a preset transform to said paired vectors; and ~~wherein~~ _____in said hierarchical distance calculating step, the distance between the paired vectors, transformed by said transform step, is calculated in a preset sequence which is based on said preset transform.

38. (Currently Amended) The recording medium according to claim 37, wherein _____said vector decision step further includes a splitting step of taking out components making up each of said paired vectors, transformed by said transform step, in said preset sequence, and splitting said component into a plurality of hierarchical partial vectors; and ~~wherein~~ _____in said hierarchical distance calculating step, distance calculations between the respective components forming partial vectors are carried out hierarchically beginning from the partial vector of the uppermost hierarchy; when the integrated value of the distance calculated for the totality of the components making up the partial vectors up to a given

hierarchy is lower than said first threshold value, the distance calculations between the components forming the partial vectors of the hierarchy lower by one hierarchy are carried out.

39. (Currently Amended) A computer-controllable recording medium having recorded thereon a program for having a computer execute the processing of detecting similar time series of a pair of time series patterns, with the time series patterns being time series of vectors, said program comprising: a vector decision step of calculating the degree of similarity between a pair of vectors of said paired time series patterns and providing a decision as to whether or not said paired vectors are similar to each other, based on said degree of similarity; and a time series decision step of counting the number of similar vectors decided to be similar and/or dissimilar vectors decided to be dissimilar in said vector decision step and providing a decision as to whether or not the paired time series patterns are similar, based on the results of the counting ~~The recording medium according to claim 33,~~ wherein, _____ said time series decision step includes (a) a hierarchical counting step of hierarchically counting the number of said similar vectors and/or said dissimilar vectors, (b) a threshold value comparing step of comparing an integrated value of the number of said similar vectors and/or said dissimilar vectors, obtained in each hierarchy of said hierarchical counting step, to a second threshold value of the number of similar vectors, and (c) a decision step of determining the similarity of said paired time series patterns, responsive to the results of comparison in said threshold value comparing step, ~~wherein~~

if, in said threshold value comparing step, the integrated value of the number of said similar vectors calculated up to the last hierarchy is larger than said second threshold value, said paired time series patterns are determined to be similar in said decision step, and ~~herein,~~

if the integrated value of the number of the dissimilar vectors, calculated up to a given hierarchy, exceeds the total number of said vectors in said time series pattern less said second threshold value, said paired time series patterns are determined to be dissimilar, and control is performed to discontinue the calculations for the remaining hierarchies.